STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

DIVISION OF HABITAT

SEAN PARNELL, GOVERNOR

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FISH HABITAT PERMIT: FH11-I-0121

ISSUED: September 23, 2011

Paul Khera
Alaska Department of Transportation and Public Facilities
PO Box 112506
Juneau, AK 99811-2506

Dear Mr. Khera:

RE: Mechanized removal of beaver dams near Yakutat Airport
Stream No. 182-80-10100-2011
Sec. 15, T 28S., R 34E., C.R.M., Yakutat B-5

Pursuant to AS 16.05.841 and AS 16.05.871(b), the Alaska Department of Fish and Game (ADF&G), Division of Habitat, has reviewed your proposal to use an excavator to remove beaver dams near the Yakutat Airport runway.

Project Description

No later than October 15, 2011, you will use an excavator to remove beaver dams that are presenting an unacceptable flooding risk to the runway safety area and the FAA's navigation facilities at the Yakutat Airport. You will work from a location above ordinary high water, and not cross the stream with the excavator.

The beaver dams are located on stream no. 182-80-10100-2011 (unnamed) off the Runway 29 end of the main airport runway (approximate Lat/Lon: 59.49442° N / 139.62721° W).

Anadromous Fish Act

Stream No. 182-80-10100-2011 is specified important for spawning, rearing, or migration of anadromous fishes pursuant to AS 16.05.871(a). This stream provides rearing and spawning habitat for pink and coho salmon, as well as rearing habitat for Dolly Varden char and rainbow trout.

In accordance with AS 16.05.871(d), project approval is hereby given subject to the project description above and the terms of this permit.

You are responsible for the actions of contractors, agents, or other persons who perform work to accomplish the approved project. For any activity that significantly deviates from the approved plan, you shall notify the Division of Habitat and obtain written approval in the form of a permit

amendment before beginning the activity. Any action that increases the project's overall scope or that negates, alters, or minimizes the intent or effectiveness of any stipulation contained in this permit will be deemed a significant deviation from the approved plan. The final determination as to the significance of any deviation and the need for a permit amendment is the responsibility of the Division of Habitat. Therefore, it is recommended you consult the Division of Habitat immediately when a deviation from the approved plan is being considered.

For the purpose of inspecting or monitoring compliance with any condition of this permit, you shall give an authorized representative of the state free and unobstructed access, at safe and reasonable times, to the permit site. You shall furnish whatever assistance and information as the authorized representative reasonably requires for monitoring and inspection purposes.

This letter constitutes a permit issued under the authority of AS 16.05.871 and must be retained on site during project activities. Please be advised that this determination applies only to activities regulated by the Division of Habitat; other agencies also may have jurisdiction under their respective authorities. This determination does not relieve you of your responsibility to secure other permits: state, federal, or local. You are still required to comply with all other applicable laws.

In addition to the penalties provided by law, this permit may be terminated or revoked for failure to comply with its provisions or failure to comply with applicable statutes and regulations. The department reserves the right to require mitigation measures to correct disruption to fish and game created by the project and which was a direct result of the failure to comply with this permit or any applicable law.

You shall indemnify, save harmless, and defend the department, its agents, and its employees from any and all claims, actions, or liabilities for injuries or damages sustained by any person or property arising directly or indirectly from permitted activities or your performance under this permit. However, this provision has no effect if, and only if, the sole proximate cause of the injury is the department's negligence.

This permit decision may be appealed in accordance with the provisions of AS 44.62.330-630.

If you have any questions regarding this concurrence, please contact Kyle Moselle at (907) 465-4287 or kyle.moselle@alaska.gov.

Sincerely,
Cora Campbell
Commissioner

By Jackie Timothy
Regional Supervisor
Division of Habitat

Email cc:
Al Ott, ADF&G Habitat, Fairbanks
Brian Marston, ADF&G SE, Yakutat
Gordie Woods, ADF&G CF, Yakutat
Ryan Scott, ADF&G WC, Douglas
Bill Lucey, City of Yakutat
Randy Vigil, COE, Juneau
Steve Brockmann, USFWS, Juneau

CFR 14, FAR Part 139.337 (e)

2. Priorities for needed habitat modification and changes in land use identified in the ecological study [Wildlife Hazard Assessment], with target dates for completion.

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AAL-600
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4.0 HABITAT MANAGEMENT

4.1 OVERVIEW

Habitat management provides the most effective long-term remedial measure for reducing wildlife hazards on or near airports. Habitat management includes the physical removal or manipulation of areas that are attractive to wildlife. The ultimate goal is to make the environment fairly uniform and unattractive to species considered hazardous to aviation. Habitat modifications will be monitored carefully to ensure they reduce wildlife hazards and do not create new attractions for different wildlife. It is recognized that certain habitat features exert a stronger influence over hazardous wildlife activity than others. Food sources generally cause wildlife to repeatedly return to a given area in the face of active disturbance. As a result, disturbances such as auditory harassment have less long-term effect on animals that are feeding, than those which may be roosting or bedding. Therefore, reducing the amount or type of food attractant becomes very important. While wildlife are usually attracted to YAK for a variety and/or combination of habitat requirements (i.e., food, water, and cover), habitat management objectives involving food source reduction will be given very high priority.

Wildlife attractants also influence wildlife hazards based on their distance from the runway. The closer an attractant is to the runway, the greater its potential for creating a wildlife hazard. Prioritizing habitat management actions will include both the distance from the runway and the nature of the attractant (e.g., food attractant vs. cover attractant). Habitat management priorities have been established to delineate both the timing of needed habitat modification and the level of action which the airport will initiate regarding a specific wildlife attractant. Some of the areas identified in the habitat management actions are comprised of land and water not under the control of YAK. Therefore, all off-site (non-airport property) wildlife attractants identified during the WHA will be managed through cooperation with the appropriate resource agencies and/or private entities.

A number of habitat management actions are described in this chapter. However, wildlife populations, vegetative succession, and airport development are dynamic in nature and thus require routine monitoring and re-evaluation. These changing conditions necessitate the use of a thorough, consistent decision making process to ensure effective wildlife hazard management outcomes. Appendix I provides guidance for such a decision making process in the form of a defined wildlife hazard management strategy. The wildlife hazard management strategy development detailed in Appendix I may be consulted by YAK during future evaluations of new habitat management actions.

A number of habitat management projects were identified in the WHA. These projects coincide with many actions identified in the YAK Airport Master Plan. Habitat management project locations are delineated on the map in Appendix E. This map shows general areas in which specific projects will be conducted and does not denote size or exact boundary limits for the project. Certain projects may occur outside of the areas shown. Within the project areas shown

on this map, wide discretion will be used in the application of a particular method. Such discretion is necessary to allow for the safe and effective use of machinery and personnel, recognizing that terrain in these areas may pose limitations on the method of habitat management. Guidance for selecting future habitat management actions is provided in Appendix I.

All habitat management projects will be assigned to one of the four following categories based on the established criteria, with Category A representing the highest priority and Category D the lowest priority.

Category A: Any food attractant located within 500 feet of the centerline of Runway 11/29 or Runway 2/20. Food attractants within this area are responsible for encouraging wildlife activity in the immediate vicinity of the runway, therefore creating the greatest potential for a wildlife strike. The 500 foot distance is based on the area which is projected to be cleared of trees and shrubs within several years. This area will then become homogenous with respect to habitat and it will be prudent to manage attractants in this area similarly.

Category B: Any non-food attractant such as water or cover within 500 feet of the centerline for Runway 11/29 or Runway 2/20. These attractants also encourage wildlife activity adjacent to the runway, but to a lesser degree than food attractants.

Category C: All other food attractants located on airport property. These attractants help sustain wildlife activity on the airfield, most noticeably in the vicinity of the main ramp.

Category D: All other non-food attractants located on airport property. These attractants help sustain wildlife activity on the airfield, in some cases, providing nesting and roosting cover.

The above categories primarily cover those wildlife attractants located on airport property. Additionally, FAA Advisory Circular 150/5200-33 (Appendix B) discusses other hazardous wildlife attractants within the vicinity of airports which will need to be monitored. At Yakutat, this includes the city landfill.

4.2 HABITAT MANAGEMENT PROJECT TIMETABLE

Table 2: Habitat management projects at YAK listed in order of category based on criteria discussed in Chapter 4.1 (Although projects are listed in order of category, some projects may be completed sooner than others due to fiscal and logistical constraints). Note that some of the projects may have already been implemented or completed, but because they require a continued effort (e.g., ensuring proper refuse containment), they are listed as "ongoing". Those projects which require permitting at any level, are indicated as such (refer to Chapter 3.0 for specific permitting requirements).

MANAGEMENT CATEGORY	YAK HABITAT MANAGEMENT PROJECTS (Chapter references)	TARGET DATE	DATE COMPLETED	PERMIT(S) REQUIRED?
A	(1) Establish new ground cover in grass infields (4.5.1)	2004	2004 and ongoing maintenance	No
B	(2) Fill in low-lying areas and ditches which do not serve water drainage functions (4.4.2)	2013	2011 – to extent allowed by permits	Yes
B	(3) Remove beaver dams (4.4.2)	Ongoing	2008	Yes
B	(4) Remove trees and snags within 500' of Runway 11/29 centerline (4.5.3)	2014		Yes
C	(5) Enforce proper refuse containment (4.3.3)	Ongoing	Ongoing	No
C	(6) Culvert installations (4.4.2)	2005	2007	Yes

1. The 2004 Runway Project established a gravel ground cover in the infields. Natural grasses have started to sprout up through the gravel but we have an ongoing process to mow the grass down.
2. There are hold-ups with environmental permits because many of these ditches are fish streams.
3. In 2009 we saw no beaver activity on the airport. It appears that our beaver hazing, culling, and dam destruction has convinced the beavers to move elsewhere.
4. Trees have been felled and removed from the southeast corner of the runway intersections. Removal of other trees and brush is an ongoing effort as there is still much to remove.
5. This continues to be an ongoing issue for which the airport managers are vigilant.
6. No change.

4.3 FOOD/PREY BASE MANAGEMENT

Food provides the strongest attractant for hazardous wildlife. When food is available, many species will persist on the airfield despite repeated control efforts. Therefore, the removal and/or reduction of food sources is a top priority for habitat management.

4.3.1 Terrestrial Invertebrates

At times, terrestrial invertebrates (e.g., insects and earthworms) can be a substantial attractant for shorebirds, gulls, and some species of waterfowl. Primary areas that harbor ground insects and earthworms are the grassy infields immediately adjacent to Runway 11/29 and Runway 2/20. Periods of heavy rain contribute to increased earthworm availability, as worms come to the

ground surface to avoid saturated soils.

The Wildlife Coordinator is responsible for carrying out airfield maintenance operations in a manner that minimizes insect and earthworm availability; specifically, halting or delaying mowing operations if a significant hazard is created by birds which become attracted to insects that are disturbed by the grass cutting. If such an event does not occur during a time of aircraft activity, mowing operations may be continued. Otherwise, mowing operations will be delayed until the hazard is abated by wildlife control personnel. Ultimately, the replacement of grass areas with a non-vegetative ground cover is ideal. Non-vegetative ground covers are the least likely surface to harbor invertebrates. Chapter 4.5.1 addresses this issue in more detail.

At this time, YAK does not intend to use insecticides or vermicides to reduce insects or earthworms. As worm reduction chemicals become available, YAK will consider their use only after a careful review of potential environmental impacts including secondary toxicity and the possible effects on non-target species.

4.3.2 Food Handouts

To a limited extent, food handouts by people on airport property and the surrounding community contribute to wildlife hazards at YAK. As birds come to associate humans with food, their local flight patterns can be altered, thus sometimes bringing them into conflicted airspace. Feeding of bald eagles by patrons of the Yakutat Lodge has been documented in the past. However, in recent years the lodge owner has enforced a "No eagle feeding" rule via instructions to guests and the posting of signs. This has somewhat helped to reduce the activity of birds around the lodge and terminal area. It is the policy of AKDOT&PF that this new rule be strictly enforced by the lodge owner and staff, as well as AKDOT&PF airport personnel when appropriate. Additionally, all persons will be discouraged by airport personnel from feeding any wildlife on airport property.

4.3.3 Trash and Debris

Birds which learn to associate food with humans are more difficult to disperse using non-lethal harassment techniques. Open trash receptacles, fish cleaning stations, and open fish totes have served as attractants for ravens, crows, and eagles around the airport terminal. Flights across the runways, between surrounding wooded areas and the terminal, present a hazard to aircraft. Corvids are generally recognized as having some ability to detect and avoid aircraft, and in-flight collisions with these birds are rare. However, when distracted during feeding, bathing, or agonistic behaviors (e.g., ravens chasing each other), their ability to detect and avoid aircraft becomes less certain.

It is the responsibility of all personnel who work at YAK to pick up trash and debris that could attract birds. In some cases, this may simply be a blowing candy wrapper or bag. When the source of the attractant is the result of a failure to properly secure garbage or food in an enclosed facility or container, the Wildlife Coordinator will contact the responsible party in an effort to

remedy the situation. If removal or securing of the attractant does not cause the birds to leave the area, a member of the Wildlife Patrol will be contacted to disperse the birds.

4.4 WATER MANAGEMENT

Areas of standing and flowing water on and surrounding the airfield contribute to the presence of numerous species of hazardous wildlife. In many cases, these water sources provide a food attractant in the form of fish, aquatic invertebrates, and aquatic vegetation. Therefore, these areas could also be placed under Chapter 4.3 Food/Prey Base Management. Due to the unique challenges presented by wetlands management, and for ease of reference, these areas have been included in the Water Management section. While the surrounding wetlands constitute a significant water attractant for hazardous wildlife, it is those water sources in the closest proximity to the runways which lead to the greatest wildlife strike risk.

4.4.1 Wetlands Management Policy

Wetlands are attractive to a variety of wildlife species that pose a hazard to aircraft. Most notably, waterfowl, wading birds, shorebirds, raptors, and gulls are the species associated with wetlands that are often involved in damaging strikes. Wetlands, whether naturally occurring or man-made, provide a unique combination of food, water, and cover that attract species seasonally and year-round. Because of their unique qualities, wetlands provide a stronger attractant for hazardous species than other land forms and are a priority for modification.

Wildlife attractants exert different levels of influence over a given species' behavior. This influence is dependent upon the type of habitat being provided and whether the attractant is one of food, water, cover, or a combination of the three. The strength of any given attractant can be described in terms of its ability to sustain wildlife activity in the face of increasing levels of disturbance (e.g., noise, development, competition from other species). In general, food attractants exert a strong influence over most species, resulting in distracted behaviors that can lead to a greater probability of being struck by an aircraft. Nesting cover also exerts a strong attractive influence, leading some species to remain active in areas that have somewhat high levels of disturbance. Attractants which provide a combination of food and other habitat requirements have the strongest ability to sustain wildlife activity.

AKDOT&PF acknowledges that wetlands are nationally recognized as habitats requiring special conservation. However, the FAA has asserted in FAA Advisory Circular 150/5200-33 (*Hazardous Wildlife Attractants on or near Airports*) that wetlands are a land use incompatible with safe aircraft operations and should be sighted outside an airport's operating environment. At YAK, several areas on airport property have been identified as wetlands. These areas were also identified in the WHA as hazardous wildlife attractants. It is desirable that, to the extent possible, these areas be eliminated and/or modified to reduce their attractiveness to hazardous wildlife species. In the event that mitigation is necessary to compensate for the loss of wetlands, such mitigation should be sited as far as possible from the airfield. YAK will give preference to those mitigation options which are less likely to attract hazardous wildlife species and are as far

from the runway as possible. The guidelines set forth in Chapter 4.4.1a will be followed when analyzing mitigation options.

AKDOT&PF's intent is that new construction or land use changes on airport property do not result in the creation of new wetlands or the enhancement of existing wetlands in a manner that could attract hazardous wildlife. If necessary, AKDOT&PF will consult with a Wildlife Damage Biologist during the design phase of new construction projects.

4.4.1a Wetlands Mitigation

When determining appropriate mitigation sites during the planning process for either airport development projects or off-site development projects by third parties, it is useful to analyze several factors as they relate to potential hazardous wildlife attractants.

Much of the analysis of hazardous wildlife attractants in the vicinity of an airport is guided by the following philosophy: *Lands in the vicinity of an airport can play an important part in attracting hazardous wildlife and influencing the movement of birds into and across critical airspace. The use and management of such lands is crucial to maintaining safe aircraft operations.* Furthermore, airport managers, operators, and sponsors should oppose the creation of land uses near the airport that are known to attract and sustain populations of hazardous wildlife.

The following considerations will be taken into account when judging whether a wetland in the vicinity of the airport would increase the probability of a wildlife strike:

1. What is the distance from the runway (the closer the attractant to the runway, the greater the probability for creating a wildlife hazard)?
2. Does the wetland provide a food source for hazardous wildlife, specifically waterfowl or gulls (food sources provide the strongest attractant to wildlife)?
3. Does the wetland provide open water areas in the form of ponds or tidally inundated sloughs (open water areas tend to concentrate bird activity)?
4. Does the wetland area lie under a known air carrier arrival or departure track?
5. Would a change in the land composition at the site increase the amount of hazardous wildlife activity from its present state?
6. Could the wetland divert flight patterns of birds into or across normal aircraft operating airspace?
7. Does the wetland lie in an area where wildlife control operations are feasible?

A positive response to questions 2 - 6 would indicate that a particular wetland site may have a higher probability of creating a wildlife hazard. It is the responsibility of the Wildlife Coordinator to relay concerns regarding off-site wetlands to the Environmental Section of AKDOT&PF, so that the appropriate concerns may be shared with local resource agencies.

4.4.2 Drainage Ditches

Most of the drainage ditches at YAK provide an attractant to hazardous wildlife. These ditches provide an open water source used by beavers year-round, waterfowl seasonally and eagles during times of coho salmon migration. Beaver activity further enhances the attractiveness of these ditches by expanding the amount of open surface water due to their damming activities. Culverts must be routinely cleared because of debris resulting from beaver activities. The ditches which run parallel to Runway 02/20 and Runway 11/29 hold the most water year-round and consequently have the most beaver activity. Proper management of the drainage ditches at YAK is one of the most challenging aspects of habitat management to reduce wildlife hazards.

YAK will reduce the amount of open water in drainage ditches using a combination of 1) frequent removal of beaver dams, 2) the installation of new culverts, and 3) the filling of those small ditches which lie in the safety area at the ends of Runway 11/29.

1) Beaver dam removal: Beaver dams were removed in 2008. It is recognized that beavers will in all likelihood continue their damming efforts in spite of the best efforts to dissuade them. Therefore, an active beaver removal program will be implemented as discussed in Chapter 5.4.2d.
2) Culvert installation: As part of YAK's Runway and Apron Resurfacing projects, YAK will need to install new culverts in several locations around the airfield. To prevent the damming and/or clogging of these culverts which normally occurs as a result of beaver activity, it will be necessary to install them with this potential for clogging in mind. YAK will therefore install beaver grates at the upstream opening of some of these culverts, which would effectively prevent large debris from accumulating inside the pipe. Frequent inspection and clearing of these grates will be required to ensure proper drainage. Only those culverts which lie in areas critical to wildlife hazard management will have beaver grates installed. As beavers tend to dam the upstream portion of most culverts, installing grates on only the upstream end should generally be sufficient. Beaver grates will consist of varying lengths of rebar placed through the top of the culvert and extending down into the stream substrate. The rebar will be spaced to allow the passage of immature salmonids and are not intended to prevent beavers from passing through the culvert. Additionally, other culverts around the airfield may have these structures installed on an as needed basis.
3) Filling of ditches in the safety areas: Drainage ditches which lie in the RSA at the ends of Runway 11/29 are slated to be filled for the primary purpose of creating a traversable surface to support snow removal equipment, aircraft rescue and fire fighting equipment and the occasional passage of aircraft without causing structural damage to the aircraft. A secondary purpose would be to prevent the periodic flooding of the RSA and to decrease the associated hazardous wildlife attractant.

4.5 VEGETATION MANAGEMENT

Vegetation management is designed to reduce the amount of natural cover available to hazardous wildlife species at YAK. Cover refers to any object(s) which provide shelter for nesting, loafing, roosting, hiding, or thermal protection. In some cases, vegetative cover for one species may provide a food source for another. Therefore, there is some ideological overlap in the classification of some areas under vegetation management and food/prey base management (e.g., infield grass management).

4.5.1 Grass Management

The grass areas which dominate the infield areas surrounding Runway 11/29 and Runway 02/20 provide cover for shorebirds and waterfowl. Additionally, these areas harbor insects and earthworms which serve as a food attractant for many species of birds, including gulls. Portions of the vegetation in this area are fed upon by waterfowl (e.g., grass) and bear (e.g., wild strawberries). To the extent possible, grass areas immediately adjacent to runways and taxiways will be eliminated as the opportunity and means become available. The preferred substrate at this time is one dominated by compacted gravel with only sparse vegetation (e.g., a mixture of grass and herbaceous species) present. This substrate has appeared to be the least attractive to the largest number of hazardous species which typically use grass infields at Southeast Alaska airports. Therefore, in those portions of the infield, particularly those located in the RSA, which are to be graded or disturbed during upcoming safety projects, compacted gravel will be used to stabilize the ground. Vegetation will be allowed to colonize these disturbed sites from surrounding areas at a natural rate.

Grass height is another important factor which will be considered during infield maintenance. Grass should be kept at the minimum height possible. This will aid in the detection and dispersal of flocking birds such as sandpipers and geese during airfield patrols. Normally, a more intermediate grass height is recommended at airports. However, foraging geese, which normally are attracted to short grass, have not been identified as regularly occurring at YAK. The abundance of tall infield vegetation has in the past hindered the detection of hazardous flocking birds before aircraft movements. The density of vegetation is a key component which helps deter certain flocking species in longer grass cover. At YAK, the diversity of vegetative species in the infield is too high to allow for a uniform or high density of taller vegetation. Therefore, a short grass management scheme is considered ideal at this time. This management scheme will be closely monitored by wildlife patrol personnel and any significant increase in hazardous wildlife activity resulting from a short grass management scheme will be documented. At such a time, the management of grass height may be reevaluated.

4.5.2 Shrub Management

Shrubs (e.g., willows and alders) which border most ditches and streams at YAK provide food and cover for beaver and moose. This abundance of woody cover attracts beavers and provides for

their thriving activity. Waterfowl use of open water areas in these ditches is also a concern. ADF&G requires that all new ditches which serve as anadramous fish habitat have some stream-bank stabilization provided by vegetation. YAK will provide for this stream-bank stabilization by planting willow saplings along ditch banks. While this may provide food for beaver and moose in the future, it is hoped that a dense canopy of willow shrubs may form across ditches, thereby helping to exclude waterfowl use of the open water portion of the ditches. Both gull and eagle foraging activity in these ditches should be reduced after a more complete shrub canopy becomes established over these ditches. Newly planted shrubs at YAK will be monitored to ensure that they do not become a more significant attractant to beaver and moose.

4.5.3 Woodland Management

The spruce/hemlock woodlands surrounding the runways at YAK provide nesting opportunities for eagles and crows, and provide cover for bear and moose. The complete removal of these areas is not warranted at this time, due to the limited use of these areas by hazardous species. However, some tree removal is being proposed by AKDOT&PF for the purpose of improving compliance with FAA standards. The areas to be cleared of trees include the RSA, the Object Free Area (OFA), and a portion of the Primary Surface. These areas are indicated on the map in Appendix E. The trees located at the junction of Runway 02/20 and Runway 11/29 would be removed from the area known as the Line of Sight.

Trees will be cut by mechanical means and allowed to remain where they have fallen. In order to reduce the potential for bear denning in these cut piles, efforts would be taken to keep slash piles less than four feet tall. Additionally, trees larger than 12 inches in diameter (dbh) would be cut up and scattered as needed.

4.6 STRUCTURE MANAGEMENT

Structure management deals largely with the exclusion of wildlife from man-made buildings and structures by various means. Man-made structures provide a form of cover, one of the components of habitat which attracts hazardous wildlife at YAK.

4.6.1 Airfield Equipment

Ravens and eagles use pieces of airfield equipment as perches throughout the year. However, eagles are the most common species to use perches such as radio antennae and telephone poles. These particular perches bring eagles into close proximity with aircraft operations. Because eagles are one of the most hazardous species to aircraft, due to their body mass and propensity to roost on this equipment, they will be considered the "design" species for which all exclusion devices will be targeted. An exclusion device which prohibits eagles from using a particular perch should also be able to prohibit smaller birds. It has been determined (from use at other southeast airports) that plastic spikes and thin wire spikes do not work well for eagles. Both of these types of strip spikes are commonly sold for deterring pigeons and starlings. An exclusion device using thin wires suspended above a perch is currently being tested at the Juneau International Airport (JNU). As

information regarding the efficacy of this measure at JNU becomes available, YAK may use this measure, or something similar, on frequent eagle perches. All efforts to design and implement new exclusion devices will be coordinated with the appropriate office of either the FAA or NOAA responsible for airfield equipment maintenance.

Due to the different nature of each "perch", different devices may eventually be used for each piece of airfield equipment. The Wildlife Coordinator will try to determine the efficacy of each technique by documenting wildlife activity before and after implementation. Any exclusion device will be designed and used in a manner that minimizes the risk of injury to the targeted species, if at all possible. Additionally, no exclusion device will be used in such a way that it causes interference with the normal and safe operation of the targeted equipment. The use of any additional pieces of airfield equipment as regular perches by hazardous species will be documented during daily wildlife control efforts.

4.6.2 Buildings

At YAK, the city hangar located on the north side of the main ramp has provided roosting and nesting space for swallows. Although individual swallows do not constitute a significant risk to aircraft, flocks of foraging swallows pose a hazard to aircraft due to the number of birds. Swallows typically nested in the hangar door tracks and overhanging eaves at the front of the hangar. Due to the height and lack of specialized equipment needed to reach these surfaces, exclusion is not considered a feasible measure. Therefore, YAK will remove nests using a high pressure water hose. YAK will seek to minimize the attractiveness of new buildings to swallows by ensuring that future design plans take into account the habits of these birds. Designs for new buildings will take into account the need to reduce accessibility by these birds and the need to reduce the amount of overhanging eaves and flat ceiling supports.

CFR 14, FAR Part 139.337 (e)

5. Procedures to be followed during air carrier operations, including at least -

(i) Assignment of personnel responsibilities for implementing the procedures;

(ii) Conduct of physical inspections of the movement area and other areas critical to wildlife hazard management sufficiently in advance of air carrier operations to allow time for wildlife controls to be effective;

(iii) Wildlife control measures; and

(iv) Communication between the wildlife control personnel and any air traffic control tower in operation at the airport.

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AAL-600
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5.0 WILDLIFE CONTROL PROCEDURES

5.1 OVERVIEW

Wildlife hazards remaining after completion of identified habitat modifications or those hazards existing in areas where habitat manipulation is not feasible, will be reduced or eliminated by employing legal, effective, and practical control measures. The method or procedure used at any given time will be based on the target species, the number of animals present, current air traffic, and other factors including the relative safety of the method given the location. A specific control action may be a combination of two or more types of control techniques, for instance: pyrotechnics, vehicle harassment, and lethal control may all be used on a persistent, large flock of geese. *The goal of all wildlife control techniques is to reduce the potential for a damaging collision between wildlife and aircraft on the airport by causing targeted wildlife to leave the airport environment.* Whether the targeted animal leaves the airport environment for a short or long period of time, a particular technique will be considered successful if a wildlife strike between the targeted species and the succeeding aircraft is avoided. It is recognized that wildlife control procedures, in general, provide only a short-term remedy for wildlife hazards. As long as the habitat is available on an airfield, wildlife may continue to persist in spite of the best efforts to control them. Wildlife control procedures will not be used in place of active habitat modification.

This section summarizes the procedures and techniques most commonly used to control wildlife at YAK. Current state and federal permits apply to all control techniques. Methods which violate the intent and letter of these permits will not be used unless written permission is given by ADF&G and USFWS. As certain techniques are proven to be ineffective, they will be discontinued. YAK will endeavor to use new techniques as they become available and will adopt those that are proven to be effective. The WHMP will be updated periodically to reflect changes in techniques and procedures being used. It is the intent of YAK to strive to use the most humane and non-lethal methods available without compromising aircraft safety.

5.2 ROLES/RESPONSIBILITIES

5.2.1 Wildlife Patrol

The role of the wildlife patrol at YAK is to detect and disperse hazardous wildlife prior to air carrier aircraft movements. In addition, it is the responsibility of patrol team members to document all airfield conditions (especially habitat attractants) which attract hazardous wildlife. Significant changes in airfield conditions (e.g., the presence of spawning salmon) resulting in a sudden increase in wildlife numbers will be immediately relayed to the Wildlife Coordinator. When possible, patrol team members will immediately remove the attractant. The wildlife patrol consists of any on-duty YAK maintenance personnel who are listed on state and federal permits. A copy of current state and federal wildlife control permits will be carried in the wildlife control

vehicle.

All on-duty maintenance personnel are responsible for ensuring the safety of aircraft by keeping an active watch over wildlife on the airfield and reporting hazards to either a patrol team member or the Wildlife Coordinator. The actual person or persons assigned to conduct runway sweeps will be assigned by the Wildlife Coordinator. Further details regarding the wildlife patrol's duties are set forth in Chapter 5.3 of this plan.

5.2.2 Wildlife Coordinator

The Wildlife Coordinator (Airport Manager), or designee, has the following responsibilities:

1. Supervise wildlife patrol team members and assign relevant duties as necessary. This includes ensuring that all patrol team members follow the procedures outlined in this chapter in a safe and efficient manner.

2. Conduct wildlife control activities as needed.

3. Maintain written records of all wildlife control activities. This task may be assigned to other personnel at the Wildlife Coordinator's discretion.

4. Report all wildlife strikes to the FAA using Form 5200-7 (see Chapter 5.5.2).

5. Maintain an adequate supply of pyrotechnics, ammunition, firearms, propane tanks, and other equipment necessary to conduct daily wildlife control operations. Ensure that all equipment is maintained in working order.

These duties are in addition to those outlined in Chapter 2.1 of this plan.

5.3 RUNWAY SWEEPS

The objective of wildlife control techniques applied by the wildlife patrol is to either disperse hazardous wildlife in advance of aircraft movements or to prevent hazardous wildlife from persisting in the airfield environment on a regular basis. *A runway sweep will be conducted by the wildlife patrol in a sufficient period of time prior to every air carrier aircraft movement to be effective.* During times when air carrier aircraft movements are within a short span of time of one another, one runway sweep may be sufficient to clear the airfield of hazardous wildlife for multiple aircraft. The minimum number of runway sweeps performed each day will be based on air carrier aircraft schedules, which vary by season. Additional runway sweeps may be performed as needed based on observed hazardous wildlife activity.

At a minimum, a runway sweep will consist of one vehicular survey of Runway 11/29. Runway

02/20 (when open to aircraft traffic) and the adjacent ramp and taxiways. All runway sweeps will include observations of the runway approaches and ditches which parallel both runways. An attempt will be made to disperse all hazardous wildlife from the immediate vicinity of the runway. If observed wildlife is deemed not to be a threat to aircraft, a notation detailing the animal's location and behavior will be made in the Wildlife Hazard Log. Subsequent runway sweeps will ensure that non-dispersed wildlife has not become a threat and is not attracting other hazardous wildlife to the area. A record of each runway sweep detailing dispersal efforts and all wildlife observations will be kept in the airport's Wildlife Hazard Log. Runway sweeps which do not detect any wildlife activity will also be recorded.

5.4 CONTROL METHODS

Personal safety is of utmost importance when conducting all wildlife control operations. No personnel should initiate a wildlife control operation if they feel an unsafe condition exists. Immediate steps should be taken to make the situation safe before initiating the action (e.g., removing possible ignition sources, moving away from other personnel). Personnel should always wear ear and eye protection when operating firearms and pyrotechnic devices. Extreme caution should be exercised when firing pyrotechnics over dry grass and/or other flammable materials or areas. Smoldering shells should not be left on the ground following firearm discharge. Furthermore, most firearm accidents can be avoided by adhering to these following safety rules:

1. Always treat a gun as if it were loaded.
2. Always keep the muzzle of the gun pointed in a safe direction.
3. Always keep the gun unloaded and your finger off the trigger until you are ready to use it.
4. Always be sure of your target and what lies beyond it.

Not all possible methods for controlling hazardous wildlife are covered in this section. Only the methods most commonly used at YAK have been described in detail. Appendix I should be consulted when considering new methods not commonly practiced at YAK. State and federal permits, and if necessary the agencies, will be consulted to ensure compliance with current regulations.

5.4.1 Bird Control

The goal of all bird control efforts at YAK is the alleviation of hazards to aircraft. Dispersing or removing birds from the airfield lessens the chances of wildlife strikes.

5.4.1a Bird Detection Methods

Bird hazards will be identified through routine runway sweeps and during the course of [illegible] work conducted by YAK personnel. A bird hazard is considered any bird residing on the [illegible]

for any length of time whose body mass is capable of causing damage to an aircraft in the event of a collision. This includes most bird species. In most cases, birds will be detected visually with the naked eye. After initial observation, the bird may be identified to species with the aid of binoculars, spotting scopes, and field guides. There are always some habitat types around the airport that attract more birds than others. Chapter 5.3 describes those areas of the airfield where special attention should be given.

- *Waterfowl* can be found in all types of non-forested areas, such as wetlands. At YAK, this includes water bodies and infield grass areas. Geese, in particular, can be found grazing in short, grassy areas and may rest on paved surfaces from time to time.

- *Shorebirds* are also found near wetlands, as well as short grass and gravel areas, which often surround runways and taxiways. At YAK during migration, shorebirds spend a great deal of time loafing and foraging in the grassy infield.

- *Raptors* can be found soaring, perching on the top of prominent trees, feeding on fish carcasses in flooded areas, or flying at low altitudes in search of rodents. At YAK, eagles frequent the terminal area and FAA antennas.

- *Gulls* are usually found near the shoreline or wherever there is some artificial food source (e.g., open dumpster). At YAK, gulls are not as common on the airfield as other groups of birds. However, large flocks may roost on the runway in inclement weather or forage in the infield during insect outbreaks.

- *Corvids* (ravens and crows) are scavengers and can be found feeding on carrion, out of open dumpsters, and will tear open accessible garbage bags. Wooded portions of the airfield may attract crows for nesting purposes.

5.4.1b Pyrotechnics

While there are many useful pyrotechnics on the market today, YAK uses three types of pyrotechnics on a regular basis. These are 12 gauge cracker shells, 15mm screamer/whistlers, and 15mm bangers. All of these pyrotechnics have a different range. The 12 gauge cracker shell has a range of approximately 75 to 100 yards. The 15mm screamer/whistler has a very erratic flight so ranges vary a great deal. On average a 15mm screamer/whistler flies a distance of 60 to 75 yards. The 15mm banger has the shortest range of all, only traveling about 25 to 30 yards. Pyrotechnics will be chosen based on the distance from the wildlife patroller to the hazardous wildlife. The use of multiple rounds and a mixture of different types of pyrotechnics for a dispersal is usually very effective. YAK may use other pyrotechnic devices at its discretion, due to the availability and cost at the time of purchase.

When possible, the wildlife patroller will position him or herself between the runway and

targeted wildlife before firing any pyrotechnics. If this is not possible, pyrotechnics should be fired so that they explode, or in the case of screamers/whistlers, travel between the hazard and the runway. Caution will be used when dispersing wildlife prior to an aircraft departing or arriving. Wildlife, in many cases, need time to recover from their initial fright before they will disperse. Hazing a flock of birds immediately before an aircraft takes off or lands can contribute to a wildlife strike because the birds may be distracted by the pyrotechnics and not able to detect the aircraft. Additionally, extreme care will be exercised so that pyrotechnics do not inadvertently strike aircraft and are not fired near an ignition source.

5.4.1c Vehicle Harassment

Vehicle harassment consists of using a vehicle to chase, herd, or scare wildlife by means of the vehicle, its lights, or its horn. This is an effective technique which can save time and reduce operating costs, such as those associated with pyrotechnic use. It works especially well for birds roosting or loafing on paved areas. However, this technique may not be as effective in dispersing certain species of wildlife and may be more short-term than other methods. Wildlife generally stay away from an area longer depending on the degree to which they were frightened. Specifically, techniques which impart a larger negative conditioning response in the animal, such as pyrotechnics, will generally keep the animal away from the site longer. Care will be exercised when chasing wildlife off-road with a vehicle, due to the potential danger of hidden obstacles in tall grass.

5.4.1d Propane Cannons

As with firearms and pyrotechnics, eye and ear protection should always be worn while using propane cannons. The use of propane gas exploders (cannons) can be an effective complement to the regular hazing of wildlife. Propane cannons will be placed in areas where bird concentrations are the greatest. In general, these areas might include the grass infield. Cannons will be used to target returning flocks of birds, such as gulls or geese, during times of unusually high bird activity. The use of cannons is considered a supplement to the active hazing of wildlife and will be used sparingly.

As with any deterrent device, wildlife can become desensitized to propane cannons by repeated exposure. To prevent desensitization it is necessary to frequently change the location of the device, the direction the sound comes from, and the firing timing. However, even with frequent changes, birds may still become accustomed to the sound. This is particularly true of gulls, which may need to be lethally controlled from time to time in order to reinforce the negative conditioning associated with cannon blasts.

5.4.1e Lethal Control

The use of lethal control in wildlife hazard mitigation can be used as a means for population

reduction and/or to reinforce the efficacy of non-lethal measures. Lethal control of birds will be used only to reinforce the negative conditioning effect of non-lethal wildlife control measures, or as a last effort to remove persistent individuals from a flock. In all cases, lethal control will be carried out in the most humane fashion possible at the time and with a recognition of public awareness. Only steel shot may be used to shoot birds. *A list of the species allowed to be lethally controlled at YAK is shown on federal and state wildlife control permits in Appendix D. A copy of this list will be kept in the Wildlife Coordinator's office.*

The following guidelines will be followed when using lethal control:

- Lethal control will be used only as reinforcement for other non-lethal deterrent methods such as pyrotechnics and vehicle hazing, or as a last effort to remove persistent individuals from a flock. The removal of one or two individuals from a flock of birds generally has the same negative conditioning effect on remaining birds as the removal of 10-15 birds from the same flock.

- Lethal shooting of flocking birds will be accompanied by a non-lethal control method (e.g., pyrotechnics, vehicle hazing) when practical.

- Loaded guns will not be kept in vehicles or buildings. *Exception*: Air rifles may be loaded and fired from the vehicle as long as:
    a. The rifle barrel extends outside of the vehicle whenever the gun is loaded.
    b. The remainder of these firearm guidelines are met.

- Caution and discretion will be used at all times. Wildlife patrol personnel will maintain an awareness that steel shot can ricochet off of water. There will be no shooting at birds on the water when a person, boat, float plane, etc. is in the background.

- Only birds which can be easily retrieved will be targeted.

The following pertains to the disposition of wildlife taken during lethal control.

In order to ensure compliance with state and federal permits regarding lethal control, wildlife control personnel will follow the conditions specified on these permits in Appendix D. Any questions regarding these permits and the included conditions should be directed to the following offices:

State Public Safety Permit (ADF&G, Permitting Office) - (907) 465-6197
Federal Depredation Permits (USFWS, Division of Migratory Bird Management) (907) 786-3459

All correspondence with the state and federal permitting agencies regarding the disposition of

wildlife taken during lethal control actions will be noted in the Wildlife Hazard Log. Such notations will include the date, time, person contacted, and a brief summary of the correspondence. Chapter 5.5.1 (Wildlife Hazard Log) should be consulted for additional record keeping instructions.

5.4.2 Mammal Control

Although hazards posed by mammals at YAK are much more infrequent than bird hazards, the potential for damage is much greater should a collision occur. The large body mass of most hazardous mammal species makes damage an almost certainty. Therefore, it is prudent to have an effective set of procedures for dealing with mammals should they occur at YAK.

5.4.2a Mammal Detection Methods

Mammal hazards will be identified through routine runway sweeps and during the course of field work conducted by YAK personnel. A mammal hazard is considered any mammal residing on the airfield for any length of time whose body mass is capable of causing damage to an aircraft in the event of a collision. This includes primarily brown bear, moose, coyote, wolf, fox, beaver, and porcupine. Bears may spend significant amounts of time near the runway while feeding on wild strawberries in the safety areas or on coho salmon in watercourses. Moose may also persist on the airfield due to the substantial amount of available willow browse. Coyote, wolf, fox, beaver and porcupine are more likely to been seen crossing the runway when transiting between areas, although beaver are present in all ditches and streams year-round.

5.4.2b Pyrotechnics

The use of pyrotechnics for mammals follows the same guidelines presented in Chapter 5.4.1b for birds. Mammals will be allowed to continue on their natural course of movement so long as it does not interfere with aircraft activity. When mammals are hazed with pyrotechnics, they often become frightened, thereby altering their course of action unpredictably. This could cause them to cross the runway and taxiways when they may not have otherwise. Therefore, pyrotechnics will generally be used to haze mammals if the following occurs:

- The animal is already on land adjacent to the runway.
- The animal is moving in the direction of the runway and a crossing appears likely.

5.4.2c Vehicle Harassment

The use of vehicles to disperse mammals from an airfield can be effective. Vehicles may be used to help herd mammals away from the runway. All animals will be approached at slow speeds so they do not become spooked and run in an unwanted direction. When prudent, lights and sirens will be used to help urge the animal along. If possible, moose and bear will be

directed off airport movement surfaces. Additionally, care will be taken by the operator when operating vehicles in tall grass areas.

5.4.2d Lethal Control

The use of lethal control of mammals to reduce wildlife hazards is currently limited to beavers. All other mammals will be controlled using non-lethal measures. In the event that lethal control is deemed necessary for mammals other than beaver, the Area Wildlife Biologist for ADF&G will be contacted immediately (Appendix Q). It is recognized that ADF&G has the sole authority for the authorization to remove mammals.

It is the intent of YAK to pursue an aggressive beaver removal program throughout the year. Therefore, pursuant to its currently held permit from ADF&G and the conditions therein (Appendix D), YAK will remove beavers from airport property using firearms. Beavers will be shot and the carcasses retrieved by Wildlife Patrol personnel as time permits. Before each beaver removal effort, the Area Wildlife Biologist for ADF&G will be notified. Such operations will be undertaken away from persons and aircraft on the ground. A concern for public safety and sensitivity will be maintained by Wildlife Patrol personnel at all times during such measures. Additionally, YAK may solicit the help of trappers to remove nuisance beavers. YAK may grant access to certain portions of the airfield to private trappers wishing to trap beaver.

5.5 RECORD KEEPING

5.5.1 Wildlife Hazard Log

All wildlife control actions and observations will be recorded on a Wildlife Hazard Log form, a copy of which is provided in Appendix H. The Wildlife Hazard Log is used to record the date, time, species of wildlife, number of wildlife, and action taken. It is the responsibility of each wildlife patrol team member to accurately record every control action and/or observation involving hazardous wildlife. These logs will be used to ensure compliance with state and federal permits. All runway sweeps will be recorded on this form, including sweeps in which no wildlife is observed. All Wildlife Hazard Logs will be kept onsite. The following instructions apply to recording data on the Wildlife Hazard Log form:

Year: Indicate the year at the top of the form.

Month: Enter the number of the month (e.g., 7 for July).

Day: Enter the number of the day.

Time: Enter the time and then circle AM or PM.